

DEPARTMENT OF COMMERCE

BUREAU OF STANDARDS

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UNITED STATES GOVERNMENT MASTER SPECIFICATION
FOR SCREWS, WOOD

FEDERAL SPECIFICATIONS BOARD SPECIFICATION No. 52a

[Revision Promulgated July 11, 1927. Supersedes Federal Specifications Board specification No. 52.]

This specification was officially promulgated by the Federal Specifications Board on February 1, 1923, for the use of the departments and independent establishments of the Government in the purchase of wood screws.

[The technical requirements of this revision of this specification shall become mandatory for all departments and independent establishments of the Government not later than October 11, 1927. They may be put into effect, however, at any earlier date after promulgation.]

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I. GENERAL SPECIFICATIONS

There are no general specifications applicable to this specification.

II. TYPES

Wood screws shall be furnished in three types; namely, flat, oval, or round head, as specified.

III. MATERIAL AND WORKMANSHIP

Wood screws shall be made of steel or brass, as specified, and shall be free from any defects which would affect their serviceability.

IV. GENERAL REQUIREMENTS

1. MEASUREMENT OF LENGTHS.—The length of all screws shall be measured from the largest diameter of bearing surface of the head to the extreme end of the point measured parallel to the axis of the screw.

2. MEASUREMENT OF DIAMETERS.—The diameter shall be measured on the body of the screw under the head.

3. TOLERANCE ON DIAMETER.—The maximum variation on diameter permitted is +0.004 and -0.007 inch (or +0.1 and -0.2 mm).

4. STANDARD SIZES.—The numbered screw sizes, basic and limiting diameters, and threads per inch given in Table 1 are standard.

5. TOLERANCE ON NUMBER OF THREADS PER INCH.—The maximum variation in the number of threads per inch permitted is plus or minus 10 per cent.

6. POINTS.—Standard screws shall be furnished with gimlet points. Cone and diamond pointed screws are special.

7. FINISH.—Wood screws shall be furnished plain, uncoated, unless blued, nickel plated, or other special finish is specified.

TABLE 1.—Standard size numbers, diameters, and pitches

Number of screw	Threads per inch	Diameter			Number of screw	Threads per inch	Diameter		
		Basic	Maximum	Minimum			Basic	Maximum	Minimum
		<i>Inch</i>	<i>Inch</i>	<i>Inch</i>			<i>Inch</i>	<i>Inch</i>	<i>Inch</i>
0	32	0.060	0.064	0.053	10	13	0.190	0.194	0.185
1	28	.073	.077	.066	11	12	.203	.207	.196
2	26	.085	.090	.079	12	11	.216	.220	.209
3	24	.099	.103	.092	14	10	.242	.246	.235
4	22	.112	.116	.105	16	9	.268	.272	.261
5	20	.125	.129	.118	18	8	.294	.298	.287
6	18	.138	.142	.131	20	8	.320	.324	.313
7	16	.151	.155	.144	24	7	.372	.376	.365
8	15	.164	.168	.157					
9	14	.177	.181	.170					

V. DETAIL REQUIREMENTS

1. HEAD PROPORTIONS AND LENGTH OF THREAD.—The proportions of the head and length of thread shall be as indicated in Figure 1 and Tables 2, 3, and 4.

2. INCLUDED ANGLE.—The included angle of the head on flat and oval head screws shall be 82°, with a permissible variation of +0° and -2°.

3. TOLERANCES ON LENGTH.—(a) *Flat and oval head screws.*—The maximum variations permitted in the length of flat and oval head screws are given in Table 5.

(b) *Round head screws.*—The maximum variations permitted in the length of round head screws are given in Table 6.

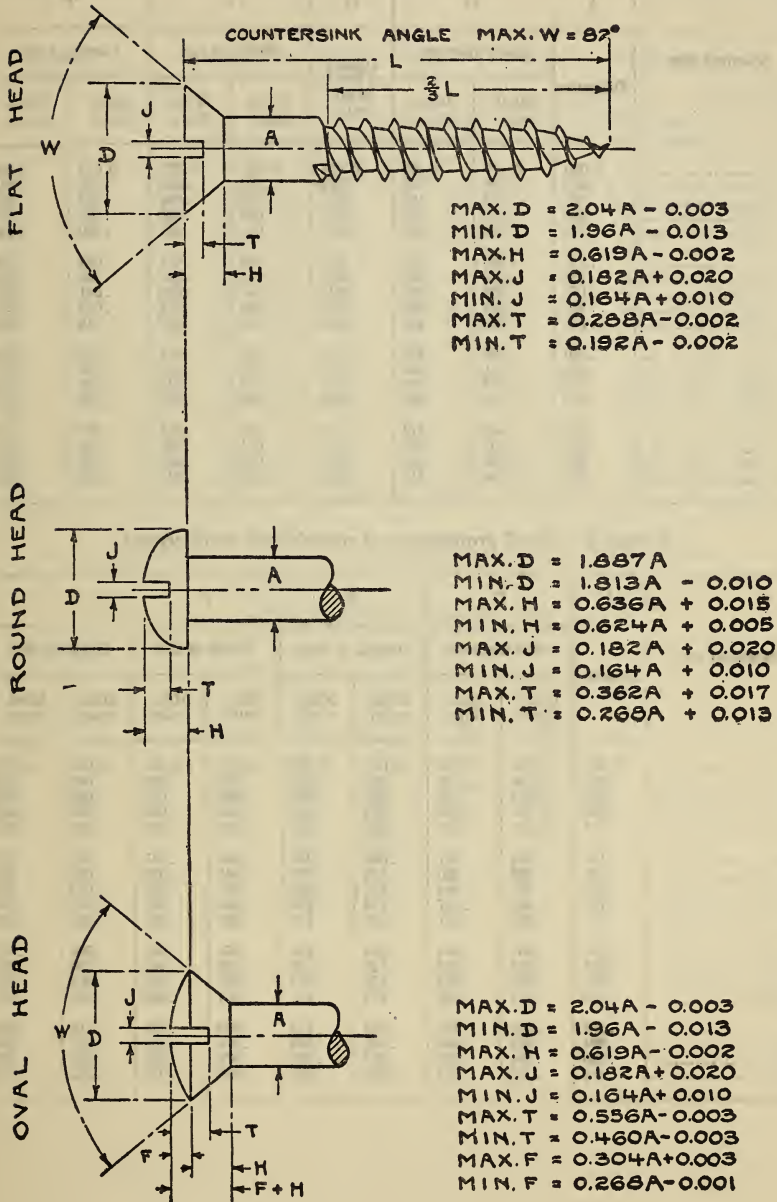


FIG. 1

TABLE 2.—Head proportions of flat-head wood screws

Nominal size	A	D		H	J		T	
	Diameter	Head diameter		Height of head: Maximum	Width of slot		Depth of slot	
		Maximum	Minimum		Maximum	Minimum	Maximum	Minimum
0.....	0.060	0.119	0.105	0.035	0.031	0.020	0.015	0.010
1.....	.073	.146	.130	.043	.033	.022	.019	.012
2.....	.086	.172	.156	.051	.036	.024	.023	.015
3.....	.099	.199	.181	.059	.038	.026	.027	.017
4.....	.112	.225	.207	.067	.040	.028	.030	.020
5.....	.125	.252	.232	.075	.043	.031	.034	.022
6.....	.138	.279	.257	.083	.045	.033	.038	.024
7.....	.151	.305	.283	.091	.047	.035	.041	.027
8.....	.164	.332	.308	.100	.050	.037	.045	.029
9.....	.177	.358	.334	.108	.052	.039	.049	.032
10.....	.190	.385	.359	.116	.055	.041	.053	.034
11.....	.203	.411	.385	.124	.057	.043	.056	.037
12.....	.216	.438	.410	.132	.059	.045	.060	.039
14.....	.242	.491	.461	.148	.064	.050	.068	.044
16.....	.268	.544	.512	.164	.069	.054	.075	.049
18.....	.294	.597	.563	.180	.074	.058	.083	.054
20.....	.320	.650	.614	.196	.078	.062	.090	.059
24.....	.372	.756	.716	.228	.088	.071	.105	.069

TABLE 3.—Head proportions of round-head wood screws

Nominal size	A	D		H		J		T	
	Diameter	Head diameter		Height of head		Width of slot		Depth of slot	
		Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum
0.....	0.060	0.113	0.099	0.053	0.042	0.031	0.020	0.039	0.029
1.....	.073	.138	.122	.061	.051	.033	.022	.043	.033
2.....	.086	.162	.146	.070	.059	.036	.024	.048	.036
3.....	.099	.187	.169	.078	.067	.038	.026	.053	.040
4.....	.112	.211	.193	.086	.075	.040	.028	.058	.043
5.....	.125	.236	.217	.095	.083	.043	.031	.062	.047
6.....	.138	.260	.240	.103	.091	.045	.033	.067	.050
7.....	.151	.285	.264	.111	.099	.047	.035	.072	.053
8.....	.164	.309	.287	.119	.107	.050	.037	.076	.057
9.....	.177	.334	.311	.128	.115	.052	.039	.081	.060
10.....	.190	.359	.334	.136	.124	.055	.041	.086	.064
11.....	.203	.383	.358	.144	.132	.057	.043	.090	.067
12.....	.216	.408	.382	.152	.140	.059	.045	.095	.071
14.....	.242	.457	.429	.169	.156	.064	.050	.105	.078
16.....	.268	.506	.476	.185	.172	.069	.054	.114	.085
18.....	.294	.555	.523	.202	.188	.074	.058	.123	.092
20.....	.320	.604	.570	.219	.205	.078	.062	.133	.099
24.....	.372	.702	.664	.252	.237	.088	.071	.152	.113

TABLE 4.—Head proportions of oval-head wood screws

Nominal size	A	D		H	J		T		F		F+H	
	Diam-eter	Head diam-eter		Height of head	Width of slot		Depth of slot		Height of oval		Maxi-mum	Mini-mum
		Maxi-mum	Mini-mum	Maxi-mum	Maxi-mum	Mini-mum	Maxi-mum	Mini-mum	Maxi-mum	Mini-mum		
0.....	0.060	0.119	0.105	0.035	0.031	0.020	0.030	0.025	0.021	0.015	0.056	0.041
1.....	.073	.146	.130	.043	.033	.022	.038	.031	.025	.019	.068	.052
2.....	.086	.172	.156	.051	.036	.024	.045	.037	.029	.022	.080	.062
3.....	.099	.199	.181	.059	.038	.026	.052	.043	.033	.026	.092	.074
4.....	.112	.225	.207	.067	.040	.028	.059	.049	.037	.029	.104	.084
5.....	.125	.252	.232	.075	.043	.031	.067	.055	.041	.033	.116	.095
6.....	.138	.279	.257	.083	.045	.033	.074	.060	.045	.036	.128	.105
7.....	.151	.305	.283	.091	.047	.035	.081	.066	.049	.039	.140	.115
8.....	.164	.332	.308	.100	.050	.037	.088	.072	.053	.043	.153	.127
9.....	.177	.358	.334	.108	.052	.039	.095	.078	.057	.046	.165	.137
10.....	.190	.385	.359	.116	.055	.041	.103	.084	.061	.050	.177	.148
11.....	.203	.411	.385	.124	.057	.043	.110	.090	.065	.053	.189	.158
12.....	.216	.438	.410	.132	.059	.045	.117	.096	.069	.057	.201	.169
14.....	.242	.491	.461	.148	.064	.050	.132	.108	.077	.064	.225	.191
16.....	.268	.544	.512	.164	.069	.054	.146	.120	.084	.071	.248	.212
18.....	.294	.597	.563	.180	.074	.058	.160	.132	.092	.078	.272	.233
20.....	.320	.650	.614	.196	.078	.062	.175	.144	.100	.085	.296	.254
24.....	.372	.756	.716	.228	.088	.071	.204	.168	.116	.099	.344	.297

TABLE 5.—Tolerances on length of flat and oval head screws¹

Nominal length	Minus tolerance	Nominal length	Minus tolerance
<i>Inches</i>	<i>Inch</i>	<i>Inches</i>	<i>Inch</i>
$\frac{1}{4}$	0.031	2	0.060
$\frac{3}{8}$	.033	$2\frac{1}{4}$	.064
$\frac{1}{2}$	.035	$2\frac{1}{2}$	.068
$\frac{5}{8}$	.037	$2\frac{3}{4}$	.072
$\frac{3}{4}$	.039	3	.076
$\frac{7}{8}$	.041	$3\frac{1}{2}$	.084
1	.043	4	.092
$1\frac{1}{4}$	.048	$4\frac{1}{2}$	.101
$1\frac{1}{2}$	.052	5	.109
$1\frac{3}{4}$	.056		

¹ Plus tolerance=0.

TABLE 6.—*Tolerances on length of round head screws*¹

Nominal length (inches)	Screw numbers								
	0	1	2	3	4	5	6	7	8
	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>
$\frac{1}{4}$ -----	0.064	0.071	0.077	0.084	0.090	-----	-----	-----	-----
$\frac{3}{8}$ -----	.065	.073	.079	.086	.092	0.099	0.105	0.112	0.118
$\frac{1}{2}$ -----	-----	.075	.081	.088	.094	.101	.107	.114	.120
$\frac{5}{8}$ -----	-----	-----	.083	.090	.096	.103	.109	.116	.122
$\frac{3}{4}$ -----	-----	-----	.085	.092	.098	.105	.111	.118	.124
$\frac{7}{8}$ -----	-----	-----	-----	.094	.100	.107	.113	.120	.126
1-----	-----	-----	-----	.096	.102	.109	.115	.122	.128
$1\frac{1}{4}$ -----	-----	-----	-----	-----	.106	.113	.119	.126	.132
$1\frac{1}{2}$ -----	-----	-----	-----	-----	.110	.117	.123	.130	.136
$1\frac{3}{4}$ -----	-----	-----	-----	-----	-----	-----	.127	.134	.140
2-----	-----	-----	-----	-----	-----	-----	.131	.138	.144
$2\frac{1}{4}$ -----	-----	-----	-----	-----	-----	-----	.135	.142	.148
$2\frac{1}{2}$ -----	-----	-----	-----	-----	-----	-----	.139	.146	.152
$2\frac{3}{4}$ -----	-----	-----	-----	-----	-----	-----	-----	-----	.156

Nominal length (inches)	Screw numbers								
	9	10	11	12	14	16	18	20	24
	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>
$\frac{1}{2}$ -----	0.127	0.133	-----	-----	-----	-----	-----	-----	-----
$\frac{5}{8}$ -----	.129	.135	0.142	0.148	-----	-----	-----	-----	-----
$\frac{3}{4}$ -----	.131	.137	.144	.150	0.163	-----	-----	-----	-----
$\frac{7}{8}$ -----	.133	.139	.146	.152	.165	-----	-----	-----	-----
1-----	.135	.141	.148	.154	.167	0.180	-----	-----	-----
$1\frac{1}{4}$ -----	.139	.145	.152	.158	.171	.184	0.198	-----	-----
$1\frac{1}{2}$ -----	.143	.149	.156	.162	.175	.188	.202	0.215	-----
$1\frac{3}{4}$ -----	.147	.153	.160	.166	.179	.192	.206	.219	-----
2-----	.151	.157	.164	.170	.183	.196	.210	.223	-----
$2\frac{1}{4}$ -----	.155	.161	.168	.174	.187	.200	.214	.227	-----
$2\frac{1}{2}$ -----	.159	.165	.172	.178	.191	.204	.218	.231	-----
$2\frac{3}{4}$ -----	.163	.169	.176	.182	.195	.208	.222	.235	-----
3-----	.167	.173	.180	.186	.199	.212	.226	.239	0.265
$3\frac{1}{2}$ -----	-----	.181	.188	.194	.207	.220	.234	.247	.273
4-----	-----	-----	-----	.202	.215	.228	.242	.255	.281
$4\frac{1}{2}$ -----	-----	-----	-----	-----	.223	.236	.250	.263	.289
5-----	-----	-----	-----	-----	.231	.244	.258	.271	.297

¹ Plus tolerance=0. Minus tolerances as given in body of table.

4. STANDARD SIZES.—(a) *Steel screws*.—The standard sizes of steel screws are given in Table 7.

(b) *Brass screws*.—The standard sizes of brass screws are given in Table 8.

TABLE 7.—Standard sizes of steel screws

[F, flat head; R, round head; O, oval head]

Lengths (inches)	No. 0 diam- eter, 0.060 inch	No. 1 diam- eter, 0.073 inch	No. 2 diam- eter, 0.086 inch	No. 3 diam- eter, 0.099 inch	No. 4 diam- eter, 0.112 inch	No. 5 diam- eter, 0.125 inch	No. 6 diam- eter, 0.138 inch	No. 7 diam- eter, 0.151 inch	No. 8 diam- eter, 0.164 inch
1/2	FR	FR	FR	FR	FR				
5/8	FR	FR	FR	FRO	FRO	FR	FR	FR	FR
3/4		FR	FR	FR	FRO	FRO	FRO	FRO	FRO
7/8			FR	FR	FRO	FRO	FRO	FRO	FRO
1			FR	FR	FRO	FRO	FRO	FRO	FRO
1 1/4				FR	FR	FR	FR	FRO	FRO
1 1/2					FR	FR	FR	FRO	FRO
1 3/4							FRO	FRO	FRO
2							FR	FR	FR
2 1/4							FR	FR	FR
2 1/2							FR	FR	FR
2 3/4									FR

Lengths (inches)	No. 9 diam- eter, 0.177 inch	No. 10 diam- eter, 0.190 inch	No. 11 diam- eter, 0.203 inch	No. 12 diam- eter, 0.216 inch	No. 14 diam- eter, 0.242 inch	No. 16 diam- eter, 0.268 inch	No. 18 diam- eter, 0.294 inch	No. 20 diam- eter, 0.320 inch	No. 24 diam- eter, 0.372 inch
1/2	FR	FR		FR					
5/8	FR	FR	FR	FR					
3/4	FRO	FRO	FR	FR					
7/8	FRO	FRO	FR	FRO	FR				
1	FRO	FRO	FRO	FRO	FRO	FR			
1 1/4	FRO	FRO	FRO	FRO	FRO	FR	FR		
1 1/2	FRO	FRO	FRO	FRO	FRO	FRO	FRO	FRO	
1 3/4	FRO	FRO	FRO	FRO	FRO	FRO	FRO	FRO	
2	FR	FRO	FRO	FRO	FRO	FRO	FRO	FRO	
2 1/4	FR	FR	FR	FRO	FRO	FR	F	F	
2 1/2	FR	FR	FR	FRO	FRO	FR	F	FR	
2 3/4	FR	FR	F	FR	FR	FR	F	F	
3	FR	FR	F	FR	FR	FR	F	F	F
3 1/2		FR	F	FR	FR	FR	F	F	F
4				FR	FR	FR	F	F	F
4 1/2					F	F	F	F	F
5					F	F	F	F	F

TABLE 8.—Standard sizes of brass screws

[F, flat head; R, round head; O, oval head]

Lengths (inches)	No. 0 di- ameter, 0.060 inch	No. 1 di- ameter, 0.073 inch	No. 2 di- ameter, 0.086 inch	No. 3 di- ameter, 0.099 inch	No. 4 di- ameter, 0.112 inch	No. 5 di- ameter, 0.125 inch	No. 6 di- ameter, 0.138 inch	No. 7 di- ameter, 0.151 inch
$\frac{1}{4}$ -----	FRO	FRO	FRO	FRO	FRO	-----	-----	-----
$\frac{3}{8}$ -----	FRO	FRO	FRO	FRO	FRO	FRO	FRO	-----
$\frac{1}{2}$ -----	-----	FRO	FRO	FRO	FRO	FRO	FRO	FRO
$\frac{3}{4}$ -----	-----	-----	FRO	FRO	FRO	FRO	FRO	FRO
$\frac{7}{8}$ -----	-----	-----	-----	-----	FRO	FRO	FRO	FRO
1-----	-----	-----	-----	-----	FRO	FRO	FRO	FRO
$1\frac{1}{4}$ -----	-----	-----	-----	-----	-----	-----	FRO	FRO
$1\frac{1}{2}$ -----	-----	-----	-----	-----	-----	-----	FRO	FRO

Lengths (inches)	No. 8 di- ameter, 0.164 inch	No. 9 di- ameter, 0.177 inch	No. 10 di- ameter, 0.190 inch	No. 11 di- ameter, 0.203 inch	No. 12 di- ameter, 0.216 inch	No. 14 di- ameter, 0.242 inch	No. 16 di- ameter, 0.268 inch	No. 18 di- ameter, 0.294 inch
$\frac{1}{4}$ -----	FRO	-----	-----	-----	-----	-----	-----	-----
$\frac{3}{8}$ -----	FRO	FRO	FRO	-----	-----	-----	-----	-----
$\frac{1}{2}$ -----	FRO	FRO	FRO	FR	FRO	-----	-----	-----
$\frac{3}{4}$ -----	FRO	FRO	FRO	FR	FR	-----	-----	-----
1-----	FRO	FRO	FRO	FR	FRO	FRO	-----	-----
$1\frac{1}{4}$ -----	FRO	FRO	FRO	FR	FRO	FRO	-----	-----
$1\frac{1}{2}$ -----	FRO	FRO	FRO	FR	FRO	FRO	-----	-----
$1\frac{3}{4}$ -----	FRO	FRO	FRO	FR	FRO	FRO	-----	-----
2-----	FRO	FRO	FRO	FR	FRO	FRO	F	F
$2\frac{1}{4}$ -----	-----	-----	FR	FR	FR	FR	F	F
$2\frac{1}{2}$ -----	-----	-----	FR	FR	FR	FR	F	F
3-----	-----	-----	-----	-----	FR	FR	F	F
$3\frac{1}{2}$ -----	-----	-----	-----	-----	F	F	F	F

VI. METHOD OF INSPECTION

Approximately 2 per cent of each size of screws in a given shipment may be taken at random and measured for compliance with the detail dimensions and number of threads.

VII. PACKING AND MARKING OF SHIPMENTS

Commercial packing shall be followed unless otherwise specified. Each package shall be marked to indicate the length, the numbered size, the material, the quantity, and the name of the actual manufacturer.

VIII. NOTES

Wood screws are designated commercially by the length and the numbered size in that order; for example: $1\frac{1}{2}$ inch, No. 12.

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